

Positive Tertiary Appraisals and Posttraumatic Stress Disorder in U.S. Male Veterans of the War in Vietnam: The Roles of Positive Affirmation, Positive Reformulation, and Defensive Denial

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A 70.9% majority of the U.S. male veterans in a nationwide sample appraised the impact of their service in Vietnam on their present lives as mainly positive. A substantial minority, 41.7%, judged the effects to be highly salient. With controls on level of exposure to war-zone stressors measured with data from military records, the valence and salience of these appraisals are investigated in relation to posttraumatic stress disorder (PTSD) and other indicators of wartime and postwar functioning. The results are consistent with the hypothesis that mainly positive tertiary appraisals are affirmations of successful wartime and postwar adaptation rather than defensive denials related to maladaptive outcomes. The possibility that mainly positive tertiary appraisals also contribute to successful postwar adaptation is discussed.

[Our philosophy] considers man to be primarily motivated by a search for meaning to his existence.

—Victor Frankl, *Psychotherapy and Existentialism*

Research on the psychological consequences of military service during wartime has been conducted for the most part from a pathogenic perspective. Despite calls for a broader vision (e.g., Elder & Clipp, 1989), this narrower focus has been especially true of research on U.S. veterans of the war in Vietnam. The emphasis

on negative outcomes has increased with growing interest in the relatively new diagnosis of posttraumatic stress disorder (PTSD), a classification that has coincided with and provided impetus to the study of Vietnam veterans (Kulka et al., 1990). Nevertheless, studies of combat veterans of previous wars (e.g., Elder & Clipp, 1989) and studies of persons who have encountered various other types of traumatic events (e.g., Tedeschi, Park, & Calhoun, 1998) have found that some exposed persons report positive changes and benefits from their experiences. What do these reports represent, and how are they related to adaptive and maladaptive outcomes?

Lazarus and Folkman (1984) have distinguished between “primary appraisals” and “secondary appraisals,” both of which occur during or immediately after the event. Primary appraisals involve judgments about whether the individual is in jeopardy, whereas secondary appraisals involve judgments about the options and resources available to the individual in responding to the event. Janoff-Bulman (1992) has described a third type of appraisal that consists of the ongoing evaluation, sometimes over many years, of the impact of an experience after it has occurred. We call these *tertiary appraisals*.

As Janoff-Bulman and Berg (1998) point out, positive and negative tertiary appraisals often coexist for a person who has been exposed to traumatic events. When tertiary appraisals are mainly negative, they are hypothesized to contribute to maladaptive outcomes:

For survivors who have painfully experienced disillusionment, the malevolence and meaninglessness of the universe is acknowledged in the new assumptive world. If these negative views are wholly embraced and therefore overwhelm the survivor’s new assumptive world, the result will be profound anxiety and despair. (Janoff-Bulman & Berg, 1998, p. 42)

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When tertiary appraisals are mainly positive with reference to life-threatening and other potentially traumatic events, Janoff-Bulman (1992) hypothesized that these "creative reformulations" (p. 117) are adaptive "cognitive strategies that ultimately contribute to the difficult process of rebuilding the victim's inner world" (p. 116). Such strategies provide "a new 'valuation' or reevaluation of living Typically, this involves a newfound appreciation of their lives, and a consequent reordering of priorities" (Janoff-Bulman & Berg, 1998, p. 42). It is a developing balance in favor of the positive in the content of tertiary appraisals that theoretically contributes to healthy adaptation.

Few studies have investigated tertiary appraisals in the lives of war veterans. One of the best designed was conducted in 1976 shortly after the end of the Vietnam war. It compared U.S. Air Force pilots and navigators who had been held captive in Vietnam with carefully chosen Air Force controls (Sledge, Boydstun, & Rahe, 1980). Prior to conducting this study, Sledge and his colleagues had participated in examinations given to all repatriated prisoners of war (POWs). The researchers were impressed by the veterans' reports of positive personal benefits from their captivity and felt that these appraisals served two very different functions for different veterans:

For some POWs, the sense of having been changed favorably by captivity is clearly a defensive maneuver aimed at denying a deeper sense of having been impaired, both physically (some do have enduring disabilities) and psychologically (in terms of mental functioning).

By contrast:

[O]ther POWs . . . have approached their lives with a new set of values concerning work, family, and relationships with others, and insist that they are wiser, more content, and know themselves and their environment better. They responded to the challenge of captivity as an opportunity to experience their human limits, and they defined their abilities and limitations more sharply than most people ever will. (pp. 430–431)

The latter appear to be examples of creative reformulations described by Janoff-Bulman (1992) and Janoff-Bulman and Berg (1998) previously.

In their questionnaire follow-up of these veterans in 1976 while the pilots and navigators were still in military service, Sledge et al. (1980) found that the former POWs, especially those treated more harshly over longer periods of imprisonment, reported more positive tertiary appraisals of the personal impact of their experiences than controls; for example, more optimism, insight, and ability to distinguish between the important and the trivial. Sledge et al. interpreted this dose-response relationship between severity of exposure and positive appraisals as evidence of "an adaptive attempt to make the most of an extraordinarily stressful situation" (p. 443) rather than as either a "defensive rationalization or an actual fact" (p. 443).

This interpretation by Sledge et al. (1980) is consistent with Janoff-Bulman's (1992) hypothesis that positive tertiary appraisals function as reformulations that contribute to adaptive outcomes. It is also possible, however, that positive tertiary appraisals are after-the-fact affirmations of prior and current adaptive outcomes rather than antecedent contributors to such outcomes, as Sledge et al. and others (e.g., Frazier, Conlon, & Glaser, 2001) have pointed out. Nor does this exhaust the possibilities. For some veterans, as

Sledge et al. suggested, defensive denial associated with serious psychological problems may be involved. Unfortunately, Sledge et al. did not investigate the relation of the positive tertiary appraisals to actual adaptive and maladaptive outcomes. They could not, therefore, test the extent to which the positive tertiary appraisals represented affirmation, reformulation, or defensive denial.

Solomon et al. (1999) conducted a study of repatriated Israeli soldiers who were captured by the Egyptians and Syrians during the Yom Kippur war in 1973. Unlike the prior study by Sledge et al. (1980) on which it was modeled, the Israeli study included a measure of PTSD symptoms (Solomon et al., 1999). Within both the Israeli POWs and combat controls, only the negative tertiary appraisals were associated with elevated PTSD symptoms. In their research with veterans mainly from World War II and the Korean war, Aldwin, Levenson, and Spiro (1994) also found that negative but not positive tertiary appraisals were correlated with elevated PTSD symptoms controlling on self-reported severity of combat exposure, as did Fontana and Rosenheck (1998) in research with Vietnam veterans. This finding is not limited to studies of veterans exposed to war-time stressors. Frazier et al. (2001), for example, got similar results in their research with victims of sexual assault.

Findings to date on the relationship between positive appraisals and symptoms of PTSD or other types of psychological distress, however, are less consistent than those for negative tertiary appraisals. In the research with samples of war veterans, Aldwin et al. (1994) found that positive tertiary appraisals were associated with lower rates of PTSD symptoms. Solomon et al. (1999), however, found no relation between such positive appraisals and PTSD symptoms in either their POW or combat control samples. Frazier et al. (2001) cite five studies of various types of severe but nonmilitary stressors in which positive appraisals are unrelated to distress, three such studies in which positive appraisals are negatively correlated with distress, and one in which positive appraisals are positively correlated with distress. In view of these inconsistencies, it seems possible that, under some circumstances, positive tertiary appraisals are neither reformulations that contribute to adaptive outcomes nor after-the-fact affirmations of adaptive outcomes. Rather, consistent with the observation by Sledge et al. (1980) previously discussed and the research of Shedler, Mayman, and Manis (1993) on the "illusion of mental health," it seems possible that, for some individuals, positive appraisals represent defensive denial related to maladaptive outcomes.

In sum, although both theory and research results to date suggest that mainly negative tertiary appraisals are associated with maladaptive outcomes, the picture is more complicated when tertiary appraisals are mainly positive. This may be because positive tertiary appraisals can represent three very different processes: Reformulation that involves recasting the meaning of a difficult experience in a positive light; affirmation that consists of acknowledging a positive adaptation to difficult experience; and defensive denial of negative features and effects of a difficult experience as a pathological maneuver. Two of these—after-the-fact affirmation and antecedent reformulation—associate mainly positive appraisals with adaptive outcomes. By contrast, the third—defensive denial—associates mainly positive appraisals with maladaptive outcomes. The purpose of the present study is to investigate the relationship between tertiary appraisals and postwar PTSD and social functioning in U.S. male veterans of the war in Vietnam. The data come from the most comprehensive investigation to date

of the psychiatric consequences of the war, the National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1990).

The American ground war in Vietnam began in earnest in 1965, and fighting continued until 1973 when U.S. troops were withdrawn. In 1975, the U.S.-backed government of South Vietnam fell to Communist forces. Throughout the period of direct American military intervention, the war became increasingly unpopular with the American public. The Gallup Poll asked the following question 12 times between June 1966 and May 1971, "Do you think the United States made a mistake in sending troops to fight in Vietnam?" During this period, the percentage saying "yes" doubled from a low of a little over 30% to a high of 61% at the time of the last measure in May 1971 (Gallup, 1972).

Over the 11-year period of this controversial war, about 3.14-million men served in the U.S. military in Vietnam (Kulka et al., 1990). Close to 60% enlisted voluntarily, with most of the remainder being drafted or, less frequently, enlisting to avoid the draft (Kulka et al., 1990). By the end of the war, over 58,000 of these men had been killed, with the majority of combat deaths resulting from enemy ambushes, booby traps and mines, and "friendly fire" (Appy, 1993). All who served in Vietnam were exposed, to a greater or lesser degree, to a wide variety of potentially traumatic situations and events. The NVVRS estimates that 15.2% of the U.S. males who served in Vietnam (Theater veterans) were suffering from PTSD 11 to 12 years after the end of the war when the study was conducted; this is six times the rate in veterans who served at the same time but not in Vietnam (Era veterans; Kulka et al., 1990).

In the present study, we use interview data from the NVVRS and data from military records and historical accounts to investigate appraisals by these Theater veterans of the effects of their service in Vietnam on their present lives. We evaluate their assessments of the importance (salience) of their experiences in Vietnam and whether they saw the effects of these experiences as mainly positive or mainly negative (valence). In formulating hypotheses about the relation of the resulting four types of tertiary appraisals (mainly positive/high salience, mainly positive/low salience, mainly negative/high salience, and mainly negative/low salience) to current PTSD and postwar social functioning, we assume that high salience, as a measure of intensity, increases whatever association is found between the valence of tertiary appraisals and the outcomes. As negative outcomes are likely to increase with the severity of war-zone stressors veterans experienced, exposure must be taken into account in testing hypotheses about the role of tertiary appraisals.

On the basis of the theory and research reviewed previously and these assumptions, there are three relatively clear-cut hypotheses that can be tested with the available data. All three involve pitting defensive denial against either affirmation or reformulation or some possible combination of the two; differentiating between reformulation and reaffirmation is more problematic and is considered separately later. The defensive denial versus affirmation or reformulation hypotheses are as follow:

Hypothesis 1. If mainly positive tertiary appraisals represent defensive denials, current PTSD and problems in role functioning after service in Vietnam would be most frequent in veterans who make mainly positive/high salience tertiary appraisals.

Hypothesis 2. If mainly positive tertiary appraisals represent affirmations and/or reformulations, current PTSD and problems in role functioning after service in Vietnam would be least frequent in veterans who make mainly positive/high salience tertiary appraisals.

Hypothesis 3. If mainly negative tertiary appraisals represent affirmations and/or reformulations, current PTSD and problems in role functioning after service in Vietnam would be most frequent in veterans who make mainly negative/high salience tertiary appraisals.

Note that Hypotheses 1 and 3 predict high rates of current PTSD and problems in postwar role functioning for different types of tertiary appraisal: Hypothesis 1 predicts the highest rates of these negative outcomes for mainly positive/high salience appraisals representing defensive denial; Hypothesis 3 predicts the highest rates of these negative outcomes for mainly negative/high salience appraisals representing affirmation or reformulation. It is possible that individual variation, possibly in personality or defensive style, could result in both hypotheses being confirmed for different subgroups of individuals. If so, which subgroup would have the higher rate of negative outcomes depends on whether defensive denial represents more severe underlying problems than negative affirmations or negative reformulations that are nearer reality.

Hypotheses 1, 2, and 3 do not differentiate between tertiary appraisals that represent after-the-fact affirmations of adaptive or maladaptive outcomes, on the one hand, and tertiary appraisals that represent antecedent positive or negative reformulations that contribute to such outcomes, on the other. If Hypotheses 2 and 3 are supported, we attempt to distinguish between the two by investigating whether the tertiary appraisals represent affirmation of prior role functioning during service in Vietnam and, by extension, affirmation, at least in part, of post-war adaptation as well. More specifically, this 4th hypothesis is that if tertiary appraisals represent affirmation, superior military performance in Vietnam will be associated with mainly positive tertiary appraisals and with low rates of current PTSD and problems in post-war social functioning; similarly, poor military performance will be associated with mainly negative tertiary appraisals and with high rates of these negative outcomes. Unlike affirmation, reformulation cannot be tested directly because we cannot establish the direction of the relationship between tertiary appraisals on the one hand, and current PTSD and post-war functioning on the other with the cross-sectional data available on these variables.

Method

Data Sources and Participants

Data from interviews conducted in the NVVRS (Kulka et al., 1990) were supplemented by data from military records. The nationally representative sample consisted of 1,183 U.S. male veterans who served in Vietnam at some time during the war. This sample of Theater veterans was drawn on a full probability basis from military records, and the completion rate was 83% of those Theater veterans designated for inclusion. A comparison sample of 412 male Era veterans who served in the military during the same period of time but not in Vietnam was also drawn by the same procedures, with a 76% completion rate.

A complex multistage procedure was used to oversample minority veterans. A consequence of this design is that, to obtain accurate popula-

tion estimates, weights reflecting the different probabilities of selection into the NVVRS samples must be incorporated into the statistical analysis. More details of sampling procedures and results are available in other publications from this research (e.g., Kulka et al., 1988, 1990).

The fieldwork in the NVVRS was conducted from November 1986 to February 1988, at which time the estimated mean age of the veterans was 41.5 years ($SE = 0.18$). Although only 19.8% of the men had a post-high school education at the time they went to Vietnam, by the time they were interviewed in this study, 60.0% had at least some college education. Similarly, although 83.5% had never been married when they went to Vietnam, by the time of the interview, only 5.5% were single and had never married, an estimated 55.2% were currently married with no history of being divorced or, in a few cases, were widowed, and the remaining 39.3% had been divorced or were currently separated (with 55.9% of the divorced men remarried at the time of the interview). Two widowed veterans (0.04% of the sample) were removed from analyses involving marital history. An estimated 11.5% of the male Theater veterans were African American, 5.5% were Latino, and most of the remainder were non-Latino Whites.

Measures

Tertiary Appraisals

Unlike primary and secondary appraisals that occur in the midst of a dangerous situation, tertiary appraisals begin after the immediate danger is over—in the present case, presumably after the end of the veteran's tour in Vietnam. As described by Janoff-Bulman (1992), tertiary appraisals are ongoing processes that can continue for years. In this study, they were measured at the time of the NVVRS interviews conducted with the veterans 11 to 12 years after the end of the war. The measures of salience and valence were developed from the NVVRS survey interview that was conducted with the full sample of Theater veterans. That survey is called the National Survey of the Vietnam Generation (NSVG).

Salience. Salience is measured by two items from the NSVG that asked about the current importance of the Vietnam War in the veteran's life. The first and most direct, in terms of present impact, asks, "how much would you say the Vietnam War has affected your everyday life?—a great deal, a fair amount, hardly at all, not at all." The second item asks how closely the following statement describes the veteran: "Being in the Vietnam War was the biggest event in my life up until now—very closely, somewhat closely, not too closely, not at all." These two items are only modestly correlated (Spearman's $\rho = .24$), so priority was given to the first, more direct item assessing effect on everyday life. Accordingly, high salience is operationalized as (a) a response to the first question that Vietnam has "a great deal" of effect on the veteran's everyday life or (b) a response of "a fair amount" of effect on the first question and a response of either "very" or "somewhat" on the second question about how closely the statement about Vietnam as the biggest event in life up to now describes the veteran. Low salience is indicated by all other responses to the two questions. The 38 respondents who failed to answer one of these two questions were assigned to high or low salience on the basis of the question they did answer.

Valence. Valence is measured by two questions from the NSVG about whether the effects of military service and the war were positive or negative. The first question is, "overall, do you feel that you personally benefited in the long run or were set back in the long run by having been involved in the Vietnam War?," with the fixed alternative response categories of "personally benefited," "set back," or "no impact" (if this answer was volunteered). The second question is, "what effect has military service had on your life?" with fixed alternative response categories of "entirely positive," "mainly positive," "equally positive and negative," "mostly negative," and "entirely negative."

These two items are intercorrelated (Spearman's $\rho = .43$). However, there are ambiguities in the response category "no impact," which mixes salience with valence in the first item, and the category of "equally positive

and negative," which may do the same in the second item. To deal with these ambiguities, positive valence and negative valence were distinguished as follows.

Mainly positive valence is defined as either of the following combinations of responses: (a) "personally benefited" on the first item, which most specifically refers to experiences in Vietnam or (b) "no impact" on the first item and "entirely positive" or "mainly positive" on the second, which refers more generally to their military service. **Mainly negative valence** is defined either by (a) "set back" on the first item or by (b) "no impact" on the first item and "mostly negative" or "entirely negative" on the second item. The 17 respondents who did not answer one of these two questions were assigned valence on the basis of the question they did answer. There were also 59 respondents who volunteered "no impact" on the first question and "equally positive and negative" on the second question; these respondents were removed from the analysis.

Qualitative illustrations of the content of mainly positive and mainly negative tertiary appraisals. The NSVG interview also included three open-ended questions about the content of the appraisals. The first, asked prior to the closed questions, was, "in what ways has the Vietnam war affected your everyday life?" The next two followed the closed questions on whether effects were mainly positive or negative: "First, what were some of the *positive* things that you gained from your Vietnam experience?" and "what were some of the *negative* things?" Responses were recorded verbatim. In addition to these questions in the NSVG, the subsample of 254 male Theater veterans who were given additional diagnostic interviews was asked in the introductory section to the questions about PTSD, "overall, what do you think has been the impact of your military experience since that time?" The clinician was instructed as follows: "Record details on the facing page. If R [respondent] does not mention, probe for both perceived positive and perceived negative effects, and for various aspects of adjustment—family, work, school, etc." These diagnostic interviews were tape-recorded. Because of this additional detail from the clinical interviews, the most complete qualitative data on the content of positive and negative appraisals are available only on the small, diagnosed subsample.

PTSD

PTSD was assessed using Keane, Caddell, and Taylor's (1988) Mississippi Scale for Combat-Related PTSD (M-PTSD), as calibrated in the NVVRS to approximate a diagnosis of current PTSD with a cutpoint of 89 (Hunt et al., 1994; Kulka et al., 1988). This 35-item scale uses a fixed alternative response format and showed high internal consistency reliability (.94) in the NVVRS. With the diagnosis of current PTSD by doctoral-level clinicians using the Structured Clinical Interview for Diagnosis (SCID; Spitzer, Williams, & Gibbon, 1987) as the criterion, the M-PTSD had a sensitivity of .77 and specificity of .83 in a subsample of Theater veterans (Kulka et al., 1988). Unlike the SCID diagnoses, the M-PTSD was included in the NSVG and administered to the entire NVVRS sample.

It must be pointed out that it is likely that not all cases of current PTSD as measured by the M-PTSD are war related. However, we know from analyses of data on onsets of PTSD in the subsample diagnosed with SCID that only 1.4% of those with lifetime PTSD had first onsets that either preceded or followed their war service. This suggests that only a small minority of the veterans with current PTSD according to the M-PTSD had first onsets of the disorder that were not war related. It should also be noted that the M-PTSD, with a cutpoint of 89, identifies more current PTSD (20.4%) than do either the SCID (13.4%) or an algorithmic combination of scales called the Composite Diagnosis (15.2%), which was also used in the NVVRS (Kulka et al., 1988). The M-PTSD with this cutpoint should be understood, therefore, as identifying probable cases of current PTSD by a definition that is more inclusive than the SCID standard. Unlike the SCID but like the M-PTSD, the Composite Diagnosis was used with the entire sample. However, we chose the M-PTSD over the Composite Diagnosis

because the M-PTSD can be used in more types of analyses. The Composite Diagnosis is actually a predicted probability of PTSD, computed by Kulka et al. (1988, 1990) for all veterans and based on the best-fitting model for predicting positive diagnoses in the subsample receiving clinical assessment. This predicted probability has been used to assess rates of the current prevalence of PTSD across subgroups of veterans (Hunt et al., 1994; Kulka et al., 1988, 1990), but it cannot be used to identify current PTSD in individual veterans.

Probable Severity of Exposure to War-Zone Stressors

Three measures of probable severity of exposure to war-zone stressors were derived from military records, thus eliminating recall biases that might influence retrospective self-reports of combat exposure (e.g., Roemer, Litz, Orsillo, Ehlich, & Friedman, 1998; Southwick, Morgan, & Nicolau, 1997).

Military occupational specialty (MOS). This is a revision of a measure developed by Kulka et al. (1990) from military records of the respondent's MOS at time of discharge. Our revised measure, also based on military records, uses the more relevant MOS for each sample member at the time of his service in Vietnam. Discharge MOS is used only when the Vietnam MOS was missing from the military record, as was the case for 41 of the records. Like the original NVVRS measure, respondents were grouped into three levels of probable severity of exposure to war-zone stressors. The MOS exposure categories were created on the basis of information from military histories (e.g., Appy, 1993; Cash, Albright, & Sandstrum, 1985; Ebert, 1993; Thompson, 1990), U.S. military publications (e.g., Department of the Army, 1967; Department of the Army, Office of Personnel Operations, 1971; U.S. Army, Office of the Surgeon General, 1971), and judgments from Vietnam veteran consultants. The MOSs indicating the highest probable severity of exposure were those likely to be directly involved in combat operations and to receive enemy fire. An estimated 23.1% of male Theater veterans were in this category; examples include infantrymen, medics, combat engineers, cannon crewmen, and cannon-fire-direction specialists. The next, middle level of probable severity of exposure was composed of noncombat MOSs who were likely to be proximal to combat activity. An estimated 16.6% were in this category; examples include auto repair and motor transport operators, armored vehicle repairmen, and tactical wire specialists. Finally, MOSs indicating the lowest probable severity of exposure were service support occupations likely to be very far away from combat areas (e.g., finance specialists, storage specialists, technical draftsmen). The large majority, 60.3% of male Theater veterans, were in this group.

Monthly casualty rate during respondent's service in Vietnam. Respondents were also grouped into three levels of probable severity of exposure to war-zone stressors on the basis of the average monthly rate of U.S. military personnel killed in action (KIA) during the period that the veteran was in Vietnam. The monthly casualty rates from January 1966 through December 1971 have been published in various military histories (e.g., Clodfelter, 1995). The rates ranged from 4.20 per 1,000 in February 1968 during the Tet Offensive to 0.11 per 1,000 in November 1971, shortly before the end of United States fighting in Vietnam. The months of the respondent's tour(s) were included in the data extracted by Kulka et al. (1990) from military records. Veterans for whom the average monthly casualty rate during their tour of duty fell in the upper tertile of all of the monthly rates for the duration of the war were classified as having the highest probable severity of exposure on this measure. Those whose average monthly casualty rate fell in the middle tertile were next. The remaining veterans were classified as having the lowest probable severity of exposure.

Casualty rate of respondent's military unit in Vietnam. Various military histories (Clodfelter, 1995; Palinkas & Coben, 1985) and National Archives and Records Administration electronic data files (Combat Area Casualties Current File and [U.S. Army] Casualty Information System)

contain casualty figures for military divisions, separate brigades, and other larger units (e.g., 101st Airborne Division, 173rd Airborne Brigade) during the time period that the unit operated in Vietnam. The number of personnel in each unit was estimated from the nationally representative NVVRS sample, and a U.S. KIA rate for each unit was calculated. These ranged from a high of 78.3 U.S. KIA per 1,000 for the 1st Marine Division to a low of 0.6 U.S. KIA per 1,000 for Engineer Command. By use of these rates, military units were grouped into five levels of probable severity of exposure from extremely high (1st Marines and 173rd Airborne Brigade, with rates of 78.3 and 70.3 per 1,000, respectively) to low (seven units with rates ranging from 7.5 to 0.6 per 1,000). The largest gap between adjacent rates in the rank order of units was 12.5 per 1,000 U.S. KIA (between 173rd Airborne Brigade and 101st Airborne Division). We used this to differentiate between extremely high casualties and very high casualties. The three additional points of division occurred when a gap of 6 per 1,000 U.S. KIA or more occurred between adjacent units in the rank order of rates.

Casualty data are often not available for smaller units. Some of these units, although possessing their own name and designation, were attached to, and thus essentially part of, larger units for which casualty data were available. However, many combat support units (engineers, military police, and signal units) and service units (support commands and groups, adjutant general, composite service, maintenance, medical, ordinance, quartermaster, and transportation units) could not be assigned to any larger unit designation. For these units ($n = 25$), information contained in military histories (Clodfelter, 1995; Stanton, 1987) was used, in conjunction with the casualty data that were available for similar units, to place these unaffiliated units within one of the five categories of probable severity of exposure. The resulting distribution of male Theater veterans in the five groups is as follows: 4.5%, extremely high; 19.2%, very high; 8.0%, high; 8.3%, moderate; and 60.1%, low.

Composite. For the present analyses, the three measures described above were combined into an overall measure of probable severity of exposure to war-zone stressors. This composite is a three-category variable: high, moderate, and low exposure probabilities. Information in historical accounts of the fighting during the course of the war provided the rationale for combining the measures. First, for units at the most extreme end of combat exposure, involvement in fighting was fairly constant, even during periods with low overall casualty rates (Casey, Dougan, Lipsman, Sweetman, & Weiss, 1987; Sigler, 1992). Second, during periods with the highest casualty rates, as during the Tet Offensive in 1968, level of exposure tended to be relatively high, regardless of the unit in question (Addington, 2000; Gibson, 2000; Stanton, 1985; Zabecki, 1998a, 1998b).

In view of these considerations, the composite measure was constructed according to the following scheme, which is also represented graphically in Figure 1.

Veterans in units with the highest levels of probable exposure on the basis of U.S. KIA (i.e., 173rd Airborne Brigade, 1st Marines) were coded on the composite as having a high probability of severe exposure. Veterans in units in the next two combat levels (e.g., 101st Airborne Division, 1st Cavalry Division) were also coded as high on the composite if they served during the highest casualty rate period of the war. The only exceptions to this categorization were individuals in these high combat units with scores of 1 on the MOS variable—service support jobs with a low probability of combat exposure. Such MOSs are rare in the high-combat units, but they do exist. Veterans from military units that were in the bottom two of the five categories of probable severity of exposure (or who, if unit information was not available, had low combat MOSs) and served during a low casualty period were coded on the composite as having a low probable severity of war-zone exposure. All remaining veterans were categorized as having a moderate probable exposure.

Wartime and Postwar Role Functioning

Wartime. Two indicators of wartime role functioning according to military standards were used, both of which were taken from the service

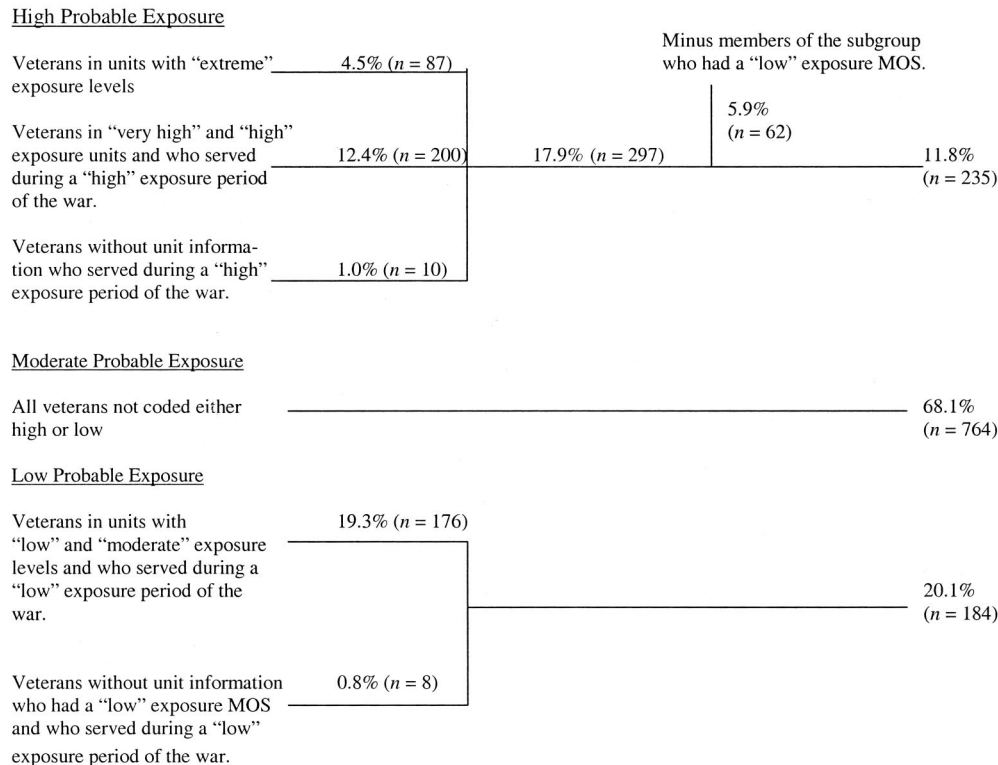


Figure 1. Composite Military Historical Measure of Probable War-Zone Stress Exposure—Weighted Percents (sample sizes in parentheses). MOS = Military occupational specialty.

records of the sampled veterans (DD-214s). The first is whether the veteran had received a medal for superior performance during his service in Vietnam. Excluded from the category of performance medals were those that were either universally awarded (i.e., Vietnam Service Medal) or nearly universally awarded (i.e., Vietnam Combat Medal). Also excluded were Combat Infantry Badges and Purple Hearts, neither of which is explicitly tied to superior performance. All medals that acknowledged meritorious action—whether that action involved valor or other kinds of superior military service—were included in the category of performance medals. The second indicator of wartime role functioning was whether the veteran's record contained a disciplinary action. Any formal action was included—Article 15s (involving formal but nonjudicial punishment) and/or any kind of court martial. Like the previous measures of combat exposure, these record-based measures of role performance during military service are independent of self-reported recall and antecedent to tertiary appraisals, current PTSD, and postwar role functioning.

Postwar. As 84% of the male theater veterans in this study had never been married before going Vietnam and as most had not advanced in their educational or occupational careers, their current statuses on these three variables were used as indicators of postwar functioning. Veterans currently married who have never separated or divorced are compared with veterans who have divorced or separated, regardless of their current status, and with those who never married. The relationships of level of educational attainment and occupational attainment (Stevens & Cho, 1985) to veterans' tertiary appraisals and to PTSD were also assessed. Education categories used were college graduate or more, high school graduate, and less than high school graduate. Occupation was grouped into high versus low socioeconomic status by use of a cutpoint of 30 on Duncan's (1961) measure, calibrated to the 1980 Census Occupational Scheme by Stevens and Cho (1985). This cutpoint yielded as closely as we found possible to an even split of the male Theater sample (40.2% low and 59.8% high).

Plan of Analysis and Statistical Procedures

The analysis of results starts with a description of the nature of tertiary appraisals, especially the relation of their valence to their salience. Next, bivariate relations between the resulting typology of tertiary appraisals (four categories defined by the combination of salience and valence) and the composite measure of probable exposure to war-zone stressors and between the latter and current PTSD is reported. The results of these bivariate analyses are then used to construct multivariate tests of the study hypotheses starting with the hypothesis of defensive denial against the affirmation and/or reformulation alternatives.

Because war-zone stress exposure is associated both with tertiary appraisals and with current PTSD, and because severity of exposure may modify the association between appraisals and outcome, these associations of appraisals and PTSD are examined separately within categories defined by war-zone exposure in the multivariate analyses. The same procedure is followed when war-time functioning and postwar functioning are investigated. To assess whether the relationships in these analyses are artifacts of the association of appraisals to antecedent demographic characteristics that are known to be risk factors for PTSD (Kulka et al., 1990), we conducted logistic regression and multinomial logit analyses in which the demographic factors of race/ethnicity, parental socioeconomic status indicated by parental (usually father's) educational attainment (in the same ordinal categories as for the veterans above), and the veteran's age at entry to Vietnam (dichotomized into under 25 and 25 and over) were statistically controlled. Because the use of weighted data artificially reduces estimated standard errors, inferential statistics were calculated using SUDAAN, a statistical package that uses Taylor-series estimation to compute standard errors (Shah et al., 1997).

Results

The first three sets of bivariate results provide the background for testing the study hypotheses. The tests themselves are presented in the next three sets of multivariate analyses.

Bivariate Relationships

The Relation of Salience to Valence in a Typology of Tertiary Appraisal

Surprisingly, in view of the history of the Vietnam war, including its ultimately unfavorable outcome for the United States, 70.9% of the male Theater veterans appraised the impact of their service on their present lives as mainly positive, as Table 1 shows. The size of this large majority is almost identical for veterans who served in Vietnam before the Tet Offensive attack by the North Vietnamese and Vietcong at the end of January 1968, when the war was still popular in the United States, and for veterans who remained in or came to Vietnam after February 1, 1968, when its popularity started its decline. Moreover, although most of those who enlisted voluntarily made mainly positive tertiary appraisals (75.5%), so did a smaller but nevertheless large majority of those who were drafted or enlisted to avoid the draft (64.0%).

Note, as shown in Table 1, that a sizable minority of the Vietnam veterans (41.7%) judged the impact of Vietnam on their present lives to be highly salient. The modal type of appraisal by Theater veterans is mainly positive/low salience, and it was made by almost half (47.7%) of the veterans. By contrast, only a little over 10% made mainly negative/low salience appraisals. The remaining veterans are fairly evenly split between mainly positive/high salience (23.2%) and mainly negative/high salience (18.5%).

The question arises as to whether military service per se would be judged by veterans to have such enduringly strong and positive present effects on their civilian lives. Era veterans (who served during the same time period but not in Vietnam) as well as Theater veterans were asked two of the four NVVRS questions used to measure salience and valence. As was expected, the Vietnam war is more salient in the lives of the Theater veterans. In answering the question about how much the war had affected their everyday lives, only 33.8% of the Era veterans, compared with 48.5% of Theater veterans, replied "a fair amount" or "a great deal" ($p < .001$). Less obviously, however, positive tertiary appraisals were significantly more common in Theater veterans than in Era veterans (58.2% vs. 49.5%, $p < .05$) in answer to the question of the

valence of the effect of military service on their lives. Whatever characteristics of military service per se are related to mainly positive/high salience tertiary appraisals, these features appear to have been amplified or augmented by service in the Vietnam war zone.

From among 254 male Theater veterans in the diagnosed subsample, we selected a random sample of 14 veterans to explore the content of responses to the several open-ended questions that called for illustrations of the positive and negative tertiary appraisals. The reported examples of the impact of Vietnam on the veterans' present lives were highly varied. The responses described changes for the better or worse in personal growth, sense of self-worth, and priorities; gains in and losses of material things and personal skills; changes for better or worse in relations with family, friends, and the larger society; changes, usually for the worse, in global beliefs about goodness, fairness, and safety; changes in spirituality or religious conviction; and changes, usually for the worse, in mental health and physical health.

Tertiary Appraisals and Probable Exposure to War-Zone Stressors

Table 2 shows the relation of tertiary appraisals to the composite measure of probable severity of exposure based on military records and historical accounts. Mainly positive/low salience appraisals made up the majority responses at the low level of probable exposure and the near-majority response at the moderate level of exposure.

At the highest level of exposure, however, this modal response differs little in frequency from the mainly negative/high salience appraisals. As the odds ratios (OR) and confidence intervals (CI) at the bottom of Table 2 show, this decrease in mainly positive/low salience appraisals and increase in mainly negative/high salience appraisals from the low to the highly exposed veterans is substantial and statistically significant with controls on ethnic/racial background, parental education, and age at entry into Vietnam.

Current PTSD and Probable Exposure to War-Zone Stressors

Table 3 shows the rates of current PTSD according to probable exposure to war-zone stressors. Veterans with probable high exposure have about twice the rate of current PTSD as veterans with probable low exposure.

Tests of Hypotheses

Defensive Denial Versus Affirmation or Reformulation

Current PTSD. Hypothesis 1 predicts that if positive tertiary appraisals represent defensive denial, then the highest rate of current PTSD will be found in veterans who made mainly positive/high salience tertiary appraisals. Table 4 shows the relation of current PTSD to type of tertiary appraisal within each level of probable severity of exposure to war-zone stressors.

At no exposure level did veterans who made mainly positive/high salience tertiary appraisals have anything approaching the highest rate of current PTSD. For example, the first OR of 0.10 in the last column of Table 4 indicates that, in the low-exposure group, the odds of having current PTSD are 10 times greater

Table 1
Types of Tertiary Appraisals According to Their Salience and Valence

	Valence					
	Positive		Negative		Total	
Salience	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
High	23.2		18.5		41.7	543
Low	47.7		10.6		58.3	548
Total	70.9	712	29.1	379		

Note. Percentages are weighted to the population.

Table 2
Type of Tertiary Appraisal According to Probable Severity of Exposure to War-Zone Stressors

War-zone exposure	Mainly positive, %		Mainly negative, %	
	High salience	Low salience	Low salience	High salience
Low, %	24.3	51.6	10.5	13.6
OR	1	1	1	1
Moderate, %	22.2	49.1	10.6	18.2
OR [95% CI]	0.63 [0.32, 1.27]	0.65 [0.35, 1.21]	0.74 [0.31, 1.78]	1
High, %	27.2	32.7	11.2	28.9
OR [95% CI]	0.54 [0.24, 1.21]	0.32 [0.15, 0.68]	0.54 [0.18, 1.61]	1
Total (n)	23.2 (273)	47.7 (439)	10.6 (109)	18.5 (270)

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CI) are estimated from a multinomial logit analysis in which ethnic/racial background, parental education, and age at entry into Vietnam are controlled.

among veterans who make mainly negative/high salience tertiary appraisals compared with veterans who make mainly positive/high salience tertiary appraisals, with the demographic factors of ethnic/racial background, parental education, and age at entry into Vietnam controlled.

However, contrary to the prediction of Hypothesis 2 about the role of affirmation and/or reformulation in mainly positive tertiary appraisals, veterans who made mainly positive/high salience appraisals did not have the lowest rates of current PTSD. Rather it was veterans making mainly positive/low salience appraisals who had the lowest rates. Moreover, it is only in the group of veterans with high levels of probable exposure that those who made mainly positive/high salience appraisals appear to compare favorably in rates of current PTSD with veterans who made mainly negative/low salience appraisals.

Hypothesis 3 concerning the role of affirmation and/or reformulation in mainly negative/high salience appraisals is more consistently supported by the results in Table 4 than is Hypothesis 2 concerning mainly positive/high salience appraisals. Within each exposure level, veterans who made mainly positive/high salience, mainly positive/low salience, or mainly negative/low salience appraisals were far less likely than those who made mainly negative/high salience appraisals to have current PTSD. The ORs in the last column in Table 4 show that the substantial elevations in PTSD risk among veterans with high salience/negative appraisals remained at all levels of war-zone exposure with demographic

variables controlled. These results are in accord with the prediction that mainly negative/high salience tertiary appraisals represent either affirmation of negative outcomes that have previously occurred or have themselves contributed to negative outcomes.

Postwar functioning. There are three additional outcomes of interest along with current PTSD. These are the indicators of post-Vietnam role functioning: educational attainment, occupational attainment, and marital status. Tables 5, 6, and 7 show the relation of these three measures to the four types of tertiary appraisal within each level of probable exposure to war-zone stressors.

At no level of exposure do veterans making mainly positive/high salience appraisals show the lowest postwar functioning on any of these measures, with the demographic variables of ethnic/racial background, parental education, and age at entry into Vietnam controlled. These results are inconsistent with Hypothesis 1 about the role of defensive denial.

Consistent with the role of affirmation or reformulation in Hypothesis 3, veterans who made mainly negative/high salience appraisals tended to show lower levels of postwar functioning than did veterans who made the other three types of appraisal. However, as with the results on current PTSD, veterans who made mainly positive/high salience appraisals did not have higher occupational, educational, or marital attainment than those who made mainly positive/low salience appraisals, as Hypothesis 2 about the role of affirmation or reformulation predicts. Nor do the veterans

Table 3
Current PTSD According to Probable Severity of Exposure to War-Zone Stressors

War-zone exposure	Current PTSD					
			Yes		No	
	%	n	%	n	%	n
Low	20.2	184	16.5		83.5	
Moderate	67.9	754	19.6		80.4	
High	11.9	235	31.2		68.8	
Total			20.4	310	79.6	863
						OR [95% CI]
						1
						1.39 [0.80, 2.42]
						2.10 [1.11, 3.97]

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CI) are estimated from a logistic regression analysis in which ethnic/racial background, parental education, and age at entry into Vietnam are controlled. PTSD = posttraumatic stress disorder.

Table 4
Current PTSD According to Type of Tertiary Appraisal Within Each Level of Probable Severity of Exposure to War-Zone Stressors

Type	%	n	Current PTSD				OR [95% CI]
			Yes		No		
			%	n	%	n	
Low war-zone exposure							
Mainly positive/high salience	24.3	46	17.9		82.1		0.10 [0.02, 0.41]
Mainly positive/low salience	51.6	82	4.8		95.2		0.02 [0.00, 0.15]
Mainly negative/low salience	10.5	12	0.0		100.0		0.00 [0.00, 0.00]
Mainly negative/high salience	13.6	33	71.6		28.4		1
Total			16.6	39	83.4	134	
Moderate war-zone exposure							
Mainly positive/high salience	22.3	165	18.9		81.1		0.14 [0.07, 0.27]
Mainly positive/low salience	48.8	288	4.0		96.0		0.02 [0.01, 0.06]
Mainly negative/low salience	10.6	78	18.9		81.1		0.13 [0.06, 0.30]
Mainly negative/high salience	18.3	162	64.2		35.8		1
Total			19.9	168	80.1	525	
High war-zone exposure							
Mainly positive/high salience	27.2	62	14.8		85.2		0.12 [0.05, 0.32]
Mainly positive/low salience	32.7	63	12.7		87.3		0.17 [0.03, 0.92]
Mainly negative/low salience	11.2	18	31.8		68.2		0.36 [0.08, 1.50]
Mainly negative/high salience	28.9	75	59.9		40.1		1
Total			29.1	86	70.9	132	

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from logistic regression analyses in which ethnic/racial background, parental education, and age at entry into Vietnam are controlled. PTSD = posttraumatic stress disorder.

who made mainly positive/high salience appraisals show consistently more attainment on these outcomes than veterans who made mainly negative/low salience appraisals.

Affirmation Versus Reformulation

With no support so far for defensive denial (Hypothesis 1) and some support for affirmation or reformulation (Hypotheses 2 and 3), it makes sense to investigate our fourth hypothesis, which seeks to distinguish between affirmation and reformulation by using data on war-time functioning. Two items in the military records, medals for performance judged to be superior and disciplinary actions for behavior judged to be problematic, provided contemporary indi-

cators of military role functioning during the veterans' service in Vietnam. Hypothesis 4 predicts that if tertiary appraisals represent affirmation, superior military performance in Vietnam will be associated with mainly positive tertiary appraisals and with low rates of current PTSD and problems of postwar social functioning; similarly, poor military performance will be associated with mainly negative tertiary appraisals and with high rates of these negative outcomes.

Table 8 shows that there is a tendency for veterans who won medals to be more likely than veterans who did not win medals to make mainly positive/low salience appraisals. Veterans who received disciplinary actions were more likely than veterans who did not receive disciplinary actions to make mainly negative/high

Table 5
Postwar Occupational Attainment According to Type of Tertiary Appraisal

Type	%	n	Occupational attainment				OR [95% CI]
			Low		High		
			%	n	%	n	
Mainly positive/high salience	23.2	271	39.0		61.0		1.91 [1.15, 3.18]
Mainly positive/low salience	47.7	438	31.0		69.0		2.70 [1.71, 4.26]
Mainly negative/low salience	10.6	109	52.7		47.3		1.10 [0.58, 2.10]
Mainly negative/high salience	18.5	270	58.4		41.6		1
Total			40.2	493	59.8	595	

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from a logistic regression analysis in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled.

Table 6
Postwar Educational Attainment According to Type of Tertiary Appraisal

Type	%	n	Educational attainment			
			Some high school	High school graduate	Some college	College graduate
Mainly positive/high OR [95% CI]	23.2	273	3.7% 1	32.1% 2.77 [1.02, 7.50]	48.8% 2.25 [0.85, 5.96]	15.5% 3.48 [1.09, 11.08]
Mainly positive/low OR [95% CI]	47.7	439	4.1% 1	36.3% 2.67 [1.04, 6.87]	38.7% 1.56 [0.62, 3.94]	20.9% 4.25 [1.46, 12.36]
Mainly negative/low OR [95% CI]	10.6	109	5.1% 1	33.8% 2.21 [0.70, 6.99]	36.5% 1.35 [0.44, 4.18]	24.7% 5.02 [1.34, 18.85]
Mainly negative/high OR [95% CI]	18.5	270	10.3% 1	29.4% 1	52.0% 1	8.3% 1
Total, % (n)			5.3 (76)	33.8 (341)	43.3 (498)	17.7 (176)

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from a multinomial logit analysis in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled.

salience appraisals rather than mainly positive/high salience or mainly positive/low salience appraisals. As both medals and disciplinary actions are antecedent to tertiary appraisals, these results suggest that tertiary appraisals to some degree affirm rewarded and punished war-time role functioning.

Table 9 shows that medals are associated with low rates of current PTSD in the group of veterans in which PTSD was most likely to develop—those with high exposure to war-zone stressors. As can be seen in the last column of Table 9, this relationship remains strong and statistically significant in a logistic regression, with controls on antecedent demographic factors. In these regression analyses, we tested the statistical significance of the apparent interaction between exposure (high vs. moderate and low) and medals; it approached significance ($p = .052$).

Disciplinary actions are positively related to PTSD at all levels of probable severity of exposure. The magnitudes of these relationships are essentially unchanged with the antecedent demographic variables controlled and actually become stronger with these controls in the high-exposure group. These results suggest that rewarded or punished actions in Vietnam

contributed, respectively, to the absence or presence of current PTSD.

Table 10 summarizes regression analyses of the relations of medals and disciplinary actions used as indicators of war-time role functioning and tertiary appraisals to current PTSD. In these analyses, the relationship of medals and disciplinary actions to PTSD was assessed both with and without controls for type of tertiary appraisal.

The analyses assessing the effects of disciplinary actions combine male Theater veterans across all war-zone exposure levels but include exposure in the model as a control. It is clear from Table 10 that the direct effect of having had a disciplinary action on the probability of PTSD is not explained by tertiary appraisals. Whether or not type of appraisal is in the model, the ORs = 2.43 and 2.23, respectively.

The results are similar for performance medals. Here the analyses were limited to the veterans with high war-zone exposure because, as Table 9 showed, this is the group within which medals are associated with lower rates of current PTSD. Among these veterans with a high probable severity of war-zone stress exposure,

Table 7
Postwar Marital Status According to Type of Tertiary Appraisal

Type	%	n	Marital history		
			Never married	Ever separated or divorced	Currently married (never divorced)
Mainly positive/high OR [95% CI]	22.9	262	6.0% 0.61 [0.22, 1.75]	42.5% 0.67 [0.39, 1.15]	51.6% 1
Mainly positive/low OR [95% CI]	48.3	433	5.1% 0.48 [0.19, 1.20]	35.0% 0.49 [0.30, 0.79]	60.0% 1
Mainly negative/low OR [95% CI]	10.7	106	5.3% 0.46 [0.13, 1.63]	34.8% 0.50 [0.26, 0.97]	59.9% 1
Mainly negative/high OR [95% CI]	18.1	260	8.4% 1	49.3% 1	42.3% 1
Total % (n)			5.9 (55)	39.3 (455)	54.8 (551)

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from a multinomial logit analysis in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled.

Table 8
Performance Medals and Disciplinary Actions Received According to Type of Tertiary Appraisal Within Each Level of Probable Severity of Exposure to War-Zone Stressors

Variable	Mainly positive						Mainly negative					
	High salience			Low salience			Low salience			High salience		
	%	<i>n</i>	%	OR [95% CI]	%	(<i>n</i>)	OR [95% CI]	%	(<i>n</i>)	OR [95% CI]	%	(<i>n</i>)
Wartime-functioning variables vs. appraisals in low-exposure veterans												
Medals												
Yes	32.6	56	22.7	0.56 [0.13, 2.33]	59.9		1.10 [0.32, 3.73]	7.4		0.63 [0.08, 4.97]	10.0	1
No	67.4	106	26.1		50.4			10.3			13.2	
Total			25.0	(43)	53.5	(79)		9.4	(10)		12.1	(30)
Disciplinary action												
Yes	28.3	46	19.8	0.37 [0.09, 1.49]	40.8		0.29 [0.08, 1.09]	16.1		0.95 [0.16, 5.44]	23.3	1
No	71.7	114	22.2		59.6			8.2			10.0	
Total			21.6	(41)	54.2	(78)		10.4	(11)		13.8	(30)
Wartime-functioning variable vs. appraisals in moderate-exposure veterans												
Medals												
Yes	42.5	269	22.3	1.25 [0.63, 2.48]	53.7		1.35 [0.76, 2.40]	9.4		1.02 [0.44, 2.37]	14.7	1
No	57.5	382	22.9		45.2			12.0			19.9	
Total			22.6	(155)	48.8	(270)		10.9	(74)		17.7	(152)
Disciplinary action												
Yes	25.3	188	22.0	0.58 [0.29, 1.17]	41.5		0.56 [0.30, 1.04]	10.6		0.60 [0.26, 1.39]	26.0	1
No	74.7	462	23.1		51.2			11.0			14.7	
Total			22.8	(43)	48.8	(79)		10.9	(10)		17.5	(30)
Wartime-functioning variable vs. appraisals in high-exposure veterans												
Medals												
Yes	42.3	85	15.8	0.69 [0.24, 1.97]	53.4		4.53 [1.40, 14.65]	9.2		1.91 [0.32, 11.49]	21.6	1
No	57.7	118	35.9		18.8			8.9			36.4	
Total			27.4	(57)	33.5	(60)		9.0	(16)		30.1	(70)
Disciplinary action												
Yes	32.6	69	25.2	0.63 [0.21, 1.94]	33.1		0.89 [0.25, 3.18]	10.1		0.85 [0.17, 4.10]	31.6	1
No	67.4	139	30.3		28.5			12.8			28.4	
Total			28.7	(60)	30.0	(57)		11.9	(18)		29.4	(73)

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from multinomial logit analyses in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled.

Table 9
Current PTSD According to Performance Medals and Disciplinary Actions Received Within Each Level of Probable Exposure of War-Zone Stressors

			Current PTSD				
			Yes		No		
War-zone exposure	%	n	%	(n)	%	(n)	OR [95% CI]
Low							
Medal							
Yes	33.6	60	14.9		85.1		0.82 [0.25, 2.67]
No	66.4	112	17.0		83.0		
Total			16.3	37	83.7	135	
Disciplinary action							
Yes	26.8	47	26.0		74.0		2.15 [0.72, 6.41]
No	73.2	123	12.6		87.4		
Total			16.2	37	83.8	133	
Moderate							
Medal							
Yes	40.4	281	15.1		84.9		0.83 [0.45, 1.41]
No	59.6	418	19.9		80.1		
Total			17.9	159	82.1	540	
Disciplinary action							
Yes	24.8	198	34.3		65.7		2.55 [1.52, 4.30]
No	75.2	503	14.5		85.5		
Total			19.4	86	80.6	133	
High							
Medal							
Yes	40.9	91	18.1		81.9		0.40 [0.16, 0.99]
No	59.1	128	39.7		60.3		
Total			30.9	86	69.1	133	
Disciplinary action							
Yes	34.5	76	43.5		56.5		2.87 [1.11, 7.39]
No	65.5	149	23.9		76.1		
Total			30.7	91	69.3	134	

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from logistic regression analyses in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled. PTSD = posttraumatic stress disorder.

Table 10
Logistic Regression Analysis of the Role of Tertiary Appraisals in the Relation of Medals and Disciplinary Actions to Current PTSD

Variable	OR [95% CI]	
	1	2
Medal ^a	0.40 [0.16, 0.99]	0.25 [0.08, 0.78]
Tertiary appraisal ^b		
Mainly positive/high salience		0.12 [0.04, 0.35]
Mainly positive/low salience		0.14 [0.02, 1.28]
Mainly negative/low salience		0.64 [0.16, 2.52]
Disciplinary action ^c	2.43 [1.60, 3.71]	2.23 [1.32, 3.78]
Tertiary appraisal ^b		
Mainly positive/high salience		0.15 [0.08, 0.26]
Mainly positive/low salience		0.03 [0.01, 0.06]
Mainly negative/low salience		0.13 [0.06, 0.27]

Note. OR = odds ratio; 95% CI = 95% confidence interval; PTSD = posttraumatic stress disorder.

^a Models (1) and (2) both restricted to veterans with high war-zone stress exposure-antecedent demographic factors controlled. ^b Mainly negative/high salience appraisals are the reference category. ^c Models (1) and (2) both estimated on all male theater veterans—level of war-zone stress exposure and antecedent demographic factors controlled.

individuals who received medals for performance were less than half as likely to have current PTSD as their nondecorated counterparts (OR = 0.40). This relationship was not reduced and appears to become, if anything, stronger with appraisal type in the model (OR = 0.25).

Clearly, at least some of the basis for tertiary appraisals of the effects of war experience was the affirmation of actual wartime functioning. However, it is also evident from Table 10 that the association of tertiary appraisals with PTSD remains strong independently of the indicators of wartime role functioning. For this reason, although the analyses in Table 10 suggest that affirmation of actual wartime role functioning plays a part, the results do not rule out the possibility that reformulation also contributes to relations between tertiary appraisals and PTSD.

The Possibility of Subgroups in Which Defensive Denial May Play a Part

There is little evidence in the results up to this point to suggest that mainly positive tertiary appraisals represent defensive denial related to pathological processes. Although not pervasive, it is still possible that defensive denial is present in some veterans and

accounts for their mainly positive appraisals of the effects of their service in Vietnam. The most likely candidates are veterans who were highly exposed to war-zone stressors, developed PTSD that is still current, and nevertheless make mainly positive tertiary appraisals of the effect of the war on their lives.

Few veterans with current PTSD and past high exposure to war-zone stressors are in either of the low salience categories (5 were mainly positive/low salience; 8 were mainly negative/low salience). However, there are 20 veterans in our sample with both current PTSD and high exposure who, nonetheless, made mainly positive/high salience appraisals. Weighted to the population of male Vietnam theater veterans, these 20 represent 2.3% of all cases of current PTSD as assessed using the M-PTSD and 13.9% of all those with current PTSD and high exposure to war-zone stressors. If the mainly positive tertiary appraisals in this group represent a maladaptive form of denial, then these veterans should demonstrate social functioning that is no better and possibly even worse than the 52 respondents with both current PTSD and high exposure, who made mainly negative/high salience appraisals.

Table 11 displays the relationship between the two war-time role functioning variables—performance medals and disciplinary actions—and the likelihood of making mainly positive/high salience appraisals versus mainly negative/high salience appraisals among highly exposed veterans with current PTSD. Clearly, the veterans in this subgroup who received performance medals were far more likely to make mainly positive/high salience appraisals than the veterans who did not, as the last column of Table 11 shows. Additional computation not included in Table 11 shows that a 51.7% majority of the highly exposed veterans with current PTSD who made mainly positive/high salience appraisals won performance medals. This percentage is somewhat higher than the average of 42.3% that won performance medals in the highly exposed group of male Theater veterans as a whole, shown in Table 8, and it is far higher than the 18% with such medals in the group of highly exposed veterans with current PTSD who made mainly negative/high salience appraisals. This association of positive tertiary appraisals with commended past military service supports the affirmation hypothesis rather than the defensive denial hypothesis.

The results in Table 11, for disciplinary actions, by contrast, suggest that having received such an action is not related to a lower frequency of positive appraisals, as the affirmation hypothesis predicts. Further analyses show, however, that this may be due, in part, to the overlap between medal earners and those receiving disciplinary actions. When the comparison is restricted to the 18 of 27 sample veterans with disciplinary actions but no performance medals, only 9.4% are estimated to have made mainly positive appraisals, compared with 19.4% of those who did not receive disciplinary actions.

Table 12 continues the comparison of the mainly positive/high salience to the mainly negative/high salience appraisers who had been highly exposed and who developed PTSD that was still current. This time the focus is on their postwar role functioning.

As this table shows, mainly positive tertiary appraisals appear to be strongly related to better postwar functioning. For some rates (e.g., the rates of currently married/never divorced and the rates of high school dropouts), mainly positive appraisers are substantially closer to the norm for male theater veterans as a whole, shown in Tables 5–7, than they are to their negatively appraising counterparts in this highly exposed/current PTSD group. Although none of the differences in Table 12 are statistically significant because of the very small subgroup sample sizes involved, the ORs generated from the multinomial logit analyses are substantial and support the affirmation and/or reformulation hypotheses rather than the defensive denial hypothesis.

Five veterans among the 20 in the mainly positive/high salience group and 8 veterans among the 50 mainly negative/high salience group were in the subsample of Theater veterans who received diagnostic examinations by clinicians. We have more detailed qualitative data on these 13 respondents than on respondents in the larger sample, including more data on the content of their positive and negative tertiary appraisals.

The qualitative data from this subgroup of highly exposed veterans with current PTSD show that only 1 of the 5 who made mainly positive/high salience tertiary appraisals gave no examples of negative impact. This veteran stated explicitly that there were “no bad effects,” an assertion that, under the circumstances, may indicate defensive denial. The remaining 4 described at least one

Table 11
Male Theater Veterans With Current PTSD and High Exposure to War-Zone Stressors: Relation of War-Time Performance Variables to High Salience Tertiary Appraisals

Wartime performance variable	%	n	Mainly positive/high salience		Mainly negative/high salience		OR [95% CI]
			%	n	%	n	
Medals							
Yes	24.4	24	40.6		59.4		4.89 [1.47, 16.26]
No	75.4	42	12.3		87.7		
Total			19.2	19	80.8	47	
Disciplinary actions							
Yes	38.3	27	21.2		78.8		1.07 [0.30, 3.77]
No	61.7	43	19.4		80.6		
Total			20.1	20	79.9	50	

Note. Percentages are weighted to the population. Odds ratios (OR) and 95% confidence intervals (95% CIs) are estimated from a logistic regression analysis in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled. PTSD = posttraumatic stress disorder.

Table 12

Male Theater Veterans With Current PTSD and High Exposure to War-Zone Stressors: Relation of Postwar Occupational Attainment, Educational Attainment, and Marital Status to Tertiary Appraisals

Variable	Occupational attainment			
	Low		High	
Mainly positive/high salience, % (<i>n</i>)	50.6 (11)		49.4 (9)	
Mainly negative/high salience, % (<i>n</i>)	59.0 (37)		41.0 (15)	
OR [95% CI]	1		2.73 [0.61, 12.22]	
Total, % (<i>n</i>)	57.4 (48)		42.6 (24)	
	Education			
	Some high school	High school graduate	Some college	College graduate
Mainly positive/high salience, %	12.2	30.3	47.5	9.9
Mainly negative/high salience, %	27.8	17.5	48.8	5.9
OR [95% CI]	1	2.99 [0.40, 22.18]	1.88 [0.36, 9.86]	3.89 [0.43, 34.81]
Total, % (<i>n</i>)	24.8 (13)	20.0 (18)	48.5 (34)	6.7 (7)
	Marital history			
	Never married	Ever separated or divorced	Currently married (never divorced)	
Mainly positive/high salience, %	6.1	51.5	42.3	
Mainly negative/high salience, %	5.0	70.8	24.1	
OR [95% CI]	0.46 [0.04, 5.03]	0.52 [0.15, 1.85]	1	
Total, % (<i>n</i>)	5.2 (4)	67.5 (41)	27.3 (26)	

Note. Percentages are weighted to the population. Odds ratio (OR) and 95% confidence intervals (95% CIs) are estimated from a logistic regression analysis (occupational attainment) and multinomial logit analyses (education and marital history) in which ethnic/racial background, parental education, and age at entry to Vietnam are controlled.

negative example of the effects of their war-time experience, ranging from the continuing disabilities from their own wounds and from witnessing death and dying to the lingering impact of questioning attitudes of those at home and experiencing problems with services from the Veterans Administration. These negative appraisals co-occur with mainly positive appraisals that may indicate reformulation by, most typically, connoting growth, maturity, and ability to cope—"growing up," "understanding others," being able to "deal with matters as they come up," and having become "a better person."

Half the respondents who made mainly negative/high salience appraisals also gave such examples of growing maturity. However, unlike all of their mainly positive counterparts, 7 of the 8 emphasized their psychiatric problems, including drug use and inability to cope. Six of the 8 mainly negative (compared with only 1 of the 5 mainly positive) gave examples suggesting alienation—anger at people back home "who were not there," accusations that lives were lost for "political reasons," anger at "society," being "cheated and lied to" by the government, people back home "not really understanding," returning to the United States and being "just put on the street."

Discussion

We emphasized at the outset that the Vietnam war has been marked by controversy. Before it ended without a victory by U.S.

forces, the war came to be opposed by most U.S. citizens. Against this background, it is striking to find that when the data for the NVVRS were collected, more than 10 years after the war, almost 71% of the U.S. male veterans who served in Vietnam perceived the impact of their wartime experiences on their present lives as mainly positive. Very large majorities made such positive tertiary appraisals, regardless of whether they served before or after the Tet offensive, when the war began to become increasingly unpopular, and regardless of whether they enlisted voluntarily. Moreover, over 40% of the veterans felt the war's influence was still highly important in their lives. As we showed, these Theater veterans made tertiary appraisals that are both more positive and more salient than those of Era veterans, who served at the same time but not in Vietnam. These appraisals appear to have more to do with the meaning of the veterans' experiences in Vietnam and how they dealt with them than with the wider context of why the nation or they themselves went to Vietnam in the first place.

We have investigated alternative hypotheses about the part played by tertiary appraisals in the Theater veterans' postwar adaptation, especially with regard to the continuing presence of PTSD: affirmation and/or reformulation for either mainly positive or mainly negative tertiary appraisals and, when tertiary appraisals are mainly positive, defensive denial. We developed measures of likely severity of exposure to war-zone stressors and military performance on the basis of contemporary military records that

represented important aspects of the veterans' experiences and actions in Vietnam. These record-based measures have the major advantages of being antecedent to and independent of the veterans' reports of their tertiary appraisals and current PTSD. By using military records of exposure and wartime role performance, we were able to establish the direction of the relationships between exposure and adaptive or maladaptive behavior in Vietnam, on the one hand, and both tertiary appraisals and current PTSD, on the other, for purposes of testing study hypotheses.

Results of the tests of the three hypotheses pitting defensive denial, on the one hand, against affirmation and/or reformulation, on the other, are remarkably consistent for both current PTSD and postwar role-functioning outcomes measured by educational and occupational attainment and by marital status.

There is almost no evidence consistent with Hypothesis 1 that mainly positive/high salience tertiary appraisals indicate pathological defensive denial. In none of the analyses do mainly positive/high salience tertiary appraisals show the highest rates of negative outcomes, usually not even coming close.

There is strong evidence consistent with Hypothesis 3 that mainly negative/high salience tertiary appraisals represent either negative affirmation or negative reformulation. In all analyses, mainly negative/high salience tertiary appraisals are associated with the highest rates of negative outcomes, usually far higher than for any of the other three types of tertiary appraisals.

The otherwise strong evidence for Hypothesis 2 that mainly positive/high salience appraisals represent either positive affirmation or positive reformulation is weakened by the fact that mainly positive/low salience appraisals tended to be more strongly associated with positive outcomes than mainly positive/high salience appraisals.

We had assumed in Hypothesis 2 that mainly positive/high salience tertiary appraisals would be associated with more adaptive outcomes than mainly positive/low salience appraisals under the affirmation and/or reformulation hypothesis. The rationale for this assumption was that salience, as a measure of intensity, would increase whatever association was being predicted between the valence of tertiary appraisals and the outcomes. Contrary to this assumption, veterans who made mainly positive/high salience appraisals had rates of current PTSD that were as high as or higher than the rates of veterans who made mainly positive/low salience appraisals, within each level of exposure to war-zone stressors. What are possible reasons for this departure from our prediction?

It is of interest that, at all levels of exposure, veterans who made mainly negative/low salience appraisals were nearer in rates of current PTSD to the lowest rate group of mainly positive/low salience appraisers than to the highest rate group of veterans who made mainly negative/high salience appraisers. It is possible that assigning low importance to the positive or negative effects of war experience is a beneficial form of positive illusion (Taylor & Brown, 1988) or mild denial (Lazarus, 1983) that facilitates positive reformulation. It is also possible that veterans who made low salience appraisals, either mainly positive or mainly negative, had major postwar experiences that led them to downgrade the importance of Vietnam in their present lives. Successive measures of tertiary appraisals over time and in relation to postwar events in the lives of the veterans would permit further investigation of this possibility.

The first three hypotheses focused on the role of defensive denial compared with affirmation and/or reformulation. In these hypotheses, no distinctions were made between affirmation and reformulation, both of which make the same prediction about the various outcomes. In a fourth hypothesis, we attempted to distinguish between affirmation and reformulation by predicting that if tertiary appraisals represent affirmation, medals that reward superior performance in Vietnam would be associated with mainly positive tertiary appraisals and with low rates of current PTSD and problems of postwar functioning; by contrast, being punished with disciplinary actions for poor military performance in Vietnam would be associated with high rates of current PTSD and high rates of these negative outcomes. Although the results are consistent with the affirmation hypothesis, they do not rule out the reformulation alternative because performance in Vietnam does not completely account for the relationship between tertiary appraisals and outcomes in the multivariate analyses.

Unfortunately, the available data do not allow us to test the reformulation alternative directly. Unlike the investigation of affirmation in which the war-time measures of functioning (records of medals and disciplinary actions) are clearly antecedent to tertiary appraisals, current PTSD, and postwar social functioning as the affirmation hypothesis requires, we cannot establish with cross-sectional data from the NVVRS interviews that tertiary appraisals are antecedent to current PTSD and postwar functioning as the reformulation hypothesis requires. Nor do we have systematic data on the content of positive appraisals that might, by describing changes in the veteran's priorities and assertions about personal development and personal beliefs, suggest that reformulation was taking place. This is the most serious limitation of our study.

There are other limitations in the present data that should be overcome in future research on tertiary appraisals. Our measures of probable exposure to war-zone stressors and war-time functioning have the virtues of objectivity and are completely independent of any recall bias that might attach to subjective self-report. However, these objective and clearly antecedent measures are less than comprehensive indicators of the variables they were selected to define. The composite measure of probable exposure does not describe individual combat events and other war-zone stressors experienced by individual veterans, which means that our controls on severity of exposure are incomplete. Performance medals hardly represent the range and variety of positive functioning in the war-zone; neither do formal disciplinary actions indicate the broad array of behaviors involved in poor performance. More comprehensive measures of performance in Vietnam would provide a better test of the affirmation hypothesis and the extent to which the results of such a test could cast doubt on a significant role for reformulation.

There is also need to improve the outcome measures. The measure of current PTSD that we used does not distinguish between the initial onset of PTSD and its course; moreover, the PTSD measure is based entirely on self-report rather than on research diagnostic examinations by experienced clinicians. Additionally, like the measures of war-zone functioning, the indicators of postwar functioning lack detail and are less than comprehensive. Marital status, for example, has the virtue of objectivity but does not provide information about the quality of the union. Further-

more, there were no measures of how the veteran is functioning as a parent, friend, or member of his community.

Our typology of tertiary appraisals is based on a combination of valence and salience, the two most important characteristics of tertiary appraisal for purposes of this study. However, the dichotomy of valence into mainly positive and mainly negative is an oversimplification. As Janoff-Bulman and Berg (1998) have pointed out, positive and negative tertiary appraisals co-occur, and the positive or the negative can alternately dominate over time. The subgroup of highly exposed Theater veterans who suffered from current PTSD and also made mainly positive/high salience tertiary appraisals are of particular interest in this regard.

Compared with their highly exposed counterparts with current PTSD who made mainly negative/high salience appraisals, this mainly positive/high salience group was more likely to have won performance medals during the war and less likely to have had disciplinary actions that were not offset by performance medals, and it showed superior functioning in postwar roles as measured by educational and occupational attainment and marital status. It is evident from the qualitative data available on a small and more intensively studied subsample of these respondents that, although valence was mainly positive, almost all gave examples of negative as well as positive effects of Vietnam on their present lives.

These examples suggest that there is a complex interplay between pathogenic processes, on the one hand, and positive growth processes, on the other, that reduces or minimizes disabilities in postwar role functioning for some highly exposed veterans despite the presence of current PTSD. Consistent with Janoff-Bulman and Berg's (1998) formulation, it may well be that—for veterans who have been highly exposed to war-zone stressors—concurrent negative and positive tertiary appraisals, in reflecting the reality of the experience as well as providing a cognitive context for growth, are most adaptive. It would follow that wholly negative tertiary appraisals, by foreclosing a context for growth, and wholly positive appraisals, by indicating the presence of defensive denial, would be most maladaptive. If this formulation is correct, the balance between positive and negative appraisals is likely to be critical. This balance is only grossly represented in the dichotomized measure of valence used here. There is need for more detailed measures that reflect individual differences in the relation of positive to negative valence in tertiary appraisals and the possible changes in this relation over time. This will require eliciting information about the number and importance of the areas of the individual's life (especially marriage, parenting, work) that he judges to be affected positively or negatively and the nature of the perceived positive and negative effects. We would expect, for example, affirmations to be indicated by quite concrete examples of positive or negative effects (e.g., obtaining or failing to obtain training or education in the military that helped or hindered occupationally after the war). By contrast, we would expect reformulation to be indicated by more abstract concepts (e.g., becoming a better or a worse person).

In conclusion, the present results are inconsistent with the maladaptive denial hypothesis as a comprehensive explanation of how mainly positive tertiary appraisals are related to the postwar readjustment of U.S. male veterans of the war in Vietnam. If pathological denial is represented in the mainly positive tertiary appraisals of more than an occasional veteran, it must occur in relation to negative outcomes that are different from those studied here; for

example, in relation to major depression, alcoholism, or physical health problems that are not comorbid with current PTSD.

Although the results show that affirmation of previously rewarded or punished wartime role functioning is represented in tertiary appraisals, our analyses have not ruled out a contributing role for reformulation in positive and negative outcomes, and some of the qualitative data support such a role—for example, the emphasis on growing maturity and ability to cope in mainly positive appraisals and the emphasis on alienation in mainly negative ones. It seems reasonable to speculate that there are complex relationships between affirmation and reformulation over time in relation to outcomes, with reformulation contributing to these outcomes, and affirmation confirming that they have occurred. If future longitudinal research documents such relationships, tertiary appraisals could become useful targets for clinical interventions aimed at increasing the balance in favor of positive reformulations. More generally, the findings underline the continuing need for an expanded focus for research on PTSD that includes positive as well as negative consequences of exposure to potentially traumatic events. One need only to look at the overwhelming majority of male Theater veterans who made mainly positive tertiary appraisals of the effects of their war service on their present lives to see how incomplete the picture is when the focus is exclusively pathogenic.

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